



US Army Corps  
of Engineers

# DCAF Bulletin

## Design Construction Analysis Feedback

No. 98-9 Issuing Office: CEMP-EC Issue Date: 8/6/98 Exp. Date: 31 DEC 00

### CEMP-EC

**Subject:** Insulation Installation for Concealed Cold and Warm Air Duct

**Applicability:** Information

**Reference:** The Corps of Engineers Guide Specification 15080 Thermal Insulation for Mechanical Systems

1. This bulletin provides information on the proper installation of concealed duct insulation. A review of deficiencies noted during Design Construction Evaluations over the last several years indicate systemic problems with proper installation of duct insulation.
2. Installation of insulation on a concealed cold air duct shall meet the following requirements.
  - a. Insulation shall be flexible type minimum density of 3/4 pounds per cubic foot for rectangular, round and oval ducts. See figures 1 and 2.
  - b. Insulation shall have a factory applied Type I vapor retarder jackets.
  - c. Insulation for rectangular, round and oval ducts shall be attached to all ducts by applying class 2 adhesive around the entire perimeter of the duct in 6 inch wide strips 12 inches on centers. See figure 5.
  - d. For rectangular and oval ducts 24 inches and larger insulation shall be additionally secured to bottom of ducts with mechanical fasteners. Fasteners shall be spaced on 18 inch centers and not more than 18 inches from duct corners. See figures 3 and 4.
  - e. All duct risers shall have mechanical fasteners on each side for all duct sizes. Fasteners shall be spaced on 18 inch centers and not more than 18 inches from duct corners.
  - f. Insulation shall be impaled on the mechanical fasteners and pressed into the adhesive. See figures 5 and 8.

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SUBJECT: Insulation Installation for Concealed Cold and Warm Air Duct

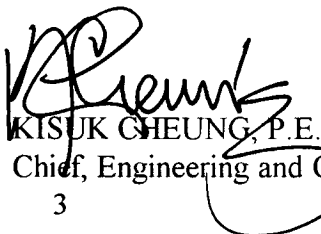
- g. Ensure vapor barrier jacket joints overlap 2 inches. See figure 6.
- h. Do not compress insulation. See figures 2 and 8.
- I. Carry insulation over standing seams and trapeze duct hangers. See figures 2 and 5.
- j. Self-locking washers shall be installed where mechanical fasteners are used. The pin shall be trimmed back and bent over. See figures 8 and 9.
- k. Jacket overlaps shall be secured with class 2 adhesive and stapled 4 inches on centers. Staples and seams shall be coated with a brush coat of vapor barrier coating. See figures 6, 7 and 10.
- l. Breaks in the jacket material shall be covered with patches of the same material as the vapor barrier. See figures 20 and 21.
  - 1. The patches shall extend 2 inches beyond the break in all directions. See figure 21.
  - 2. The patch shall be secured with class 2 adhesive and staples. See figure 22.
  - 3. Staples and joints shall be sealed with a brush coat of vapor barrier coating. See figure 23.
- m. Seal all jacket penetrations with a brush coat of vapor barrier coating. See figure 11.
- n. Insulation terminations and pin punctures shall be sealed and flashed with a reinforced vapor barrier coating finish. See figures 12 and 18.
  - 1. The coating shall overlap the adjoining insulation and uninsulated surface 2 inches. See figures 15, 16, 17 and 18.
  - 2. Pin puncture coatings shall extend 2 inches from the puncture in all directions. See figures 12, 13 and 14.
- o. Where insulation standoff brackets occur, insulation shall be extended under the bracket and the jacket terminated at the bracket. Terminate the jacket as required in (n) above.
- 3. Installation of insulation on a concealed warm air duct shall meet the following requirements. For air handling ducts for dual purpose, warm and cold air, ducts shall be insulated as specified for a cold air duct. Duct insulation shall be continuous through sleeves and prepared openings. Duct insulation shall terminate at fire dampers and flexible connections.

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SUBJECT: Insulation Installation for Concealed Cold and Warm Air Duct

- a. Insulation shall be flexible type minimum density of 3/4 pounds per cubic foot. See figures 1 and 2.
  - b. Insulation shall have a factory applied Type II vapor barrier jacket.
  - c. Insulation shall be attached to all rectangular, round and oval ducts by applying class 2 adhesive around the entire perimeter of the duct in 6 inch wide strips on 12 inch centers. See figure 5.
  - d. For rectangular and oval ducts 24 inches and larger insulation shall be additionally secured to bottom of ducts with mechanical fasteners. Fasteners shall be spaced on 18 inch centers and not more than 18 inches from duct corners. See figure 4.
  - e. All rectangular, round and oval duct risers shall have mechanical fasteners on each side for all duct sizes. Fasteners shall be spaced on 18 inch centers and not more than 18 inches from duct corners.
  - f. Insulation shall be impaled on the mechanical fasteners and pressed into the adhesive. See figures 4 and 5.
  - g. Do not compress insulation to a thickness less than that specified. See figures 2 and 8.
  - h. Carry insulation over standing seams and trapeze duct hangers. See figure 2.
  - i. Self-locking washers shall be installed where mechanical fasteners are used. The pin shall be trimmed back and bent over. See figures 8 and 9.
  - j. Jacket overlaps shall be 2 inches and the lap shall be secured with class 2 adhesive under the lap and stapled 4 inches on centers. See figures 6 and 7.
4. My point of contact is Gary Bauer at (202) 761-0205.

Encl

  
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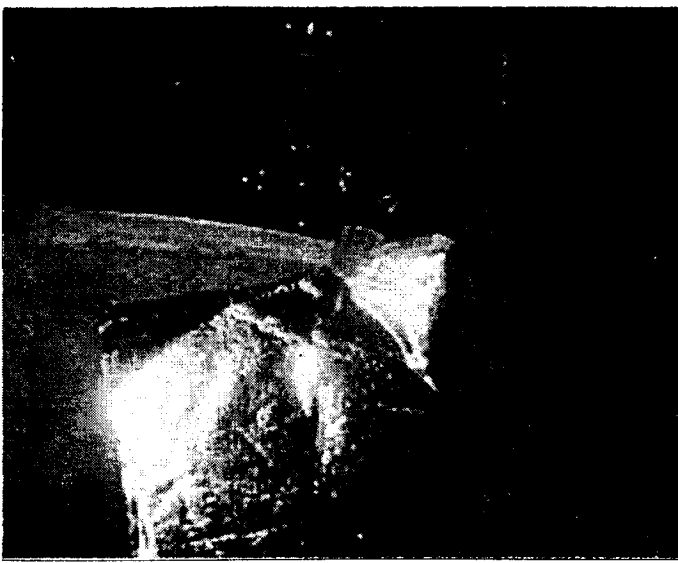


Figure 1

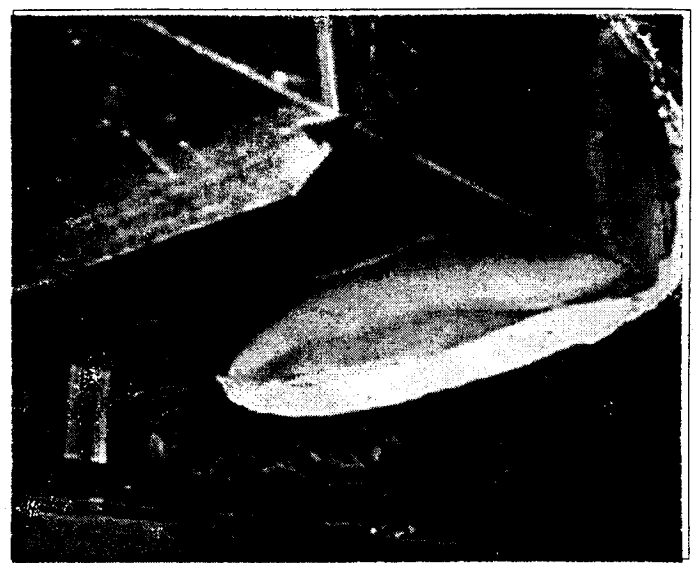


Figure 2

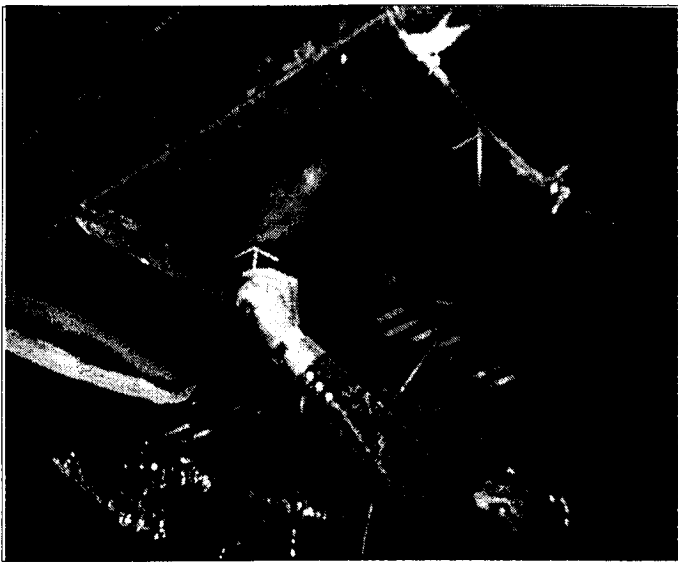


Figure 3

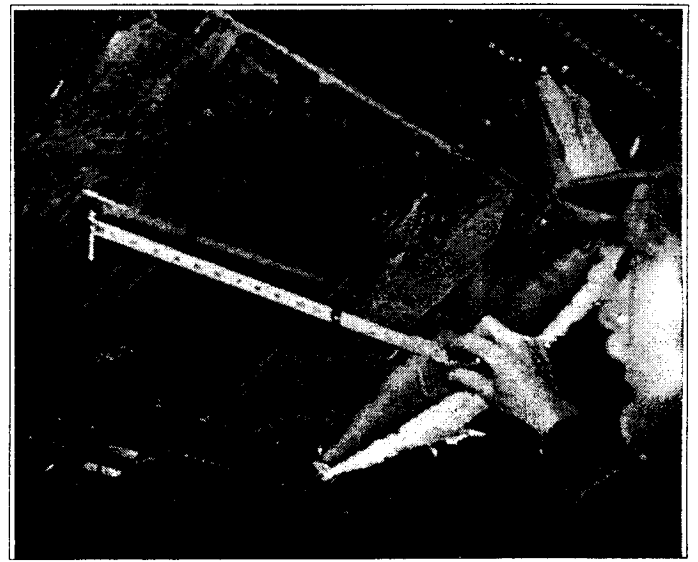


Figure 4

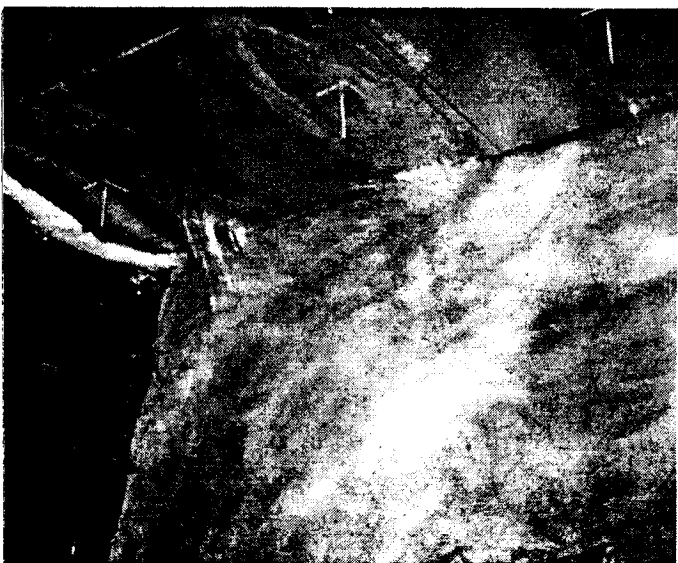


Figure 5

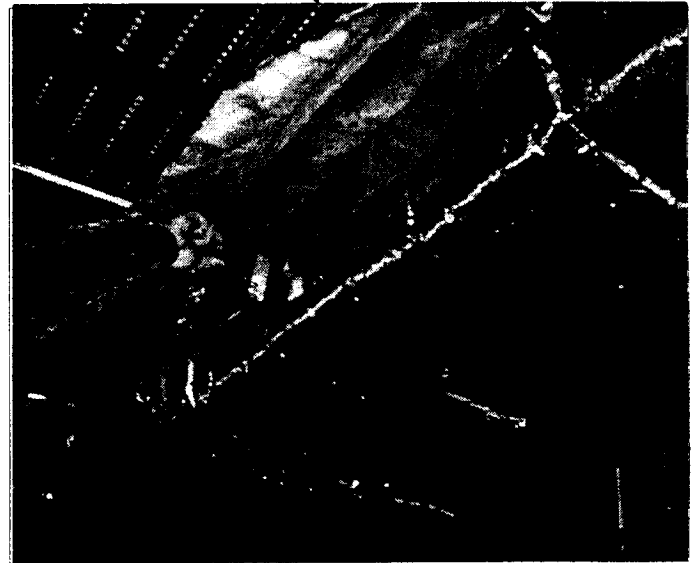


Figure 6



Figure 7



Figure 8



Figure 9

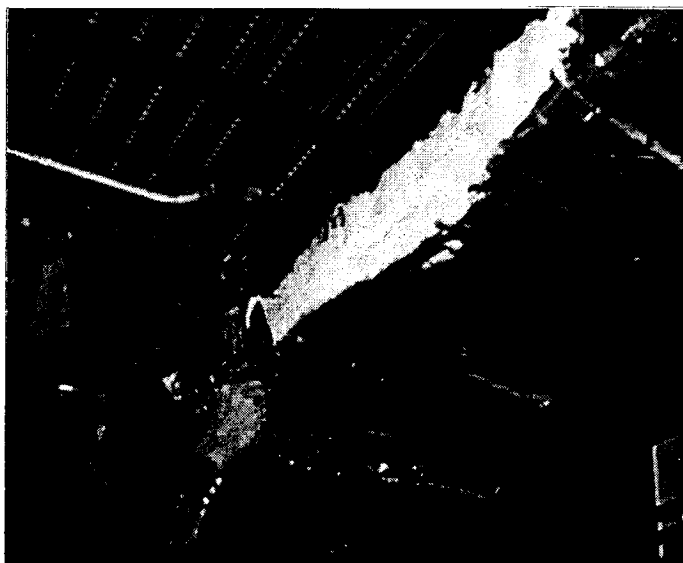


Figure 10

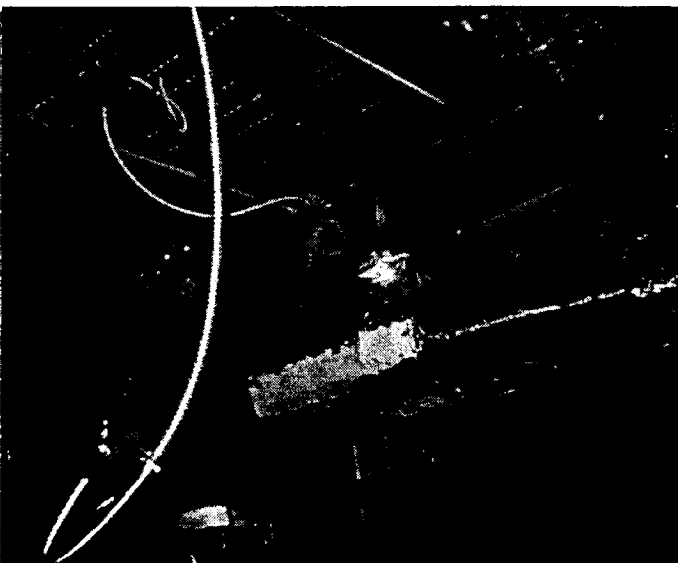


Figure 11



Figure 12



Figure 13



Figure 14

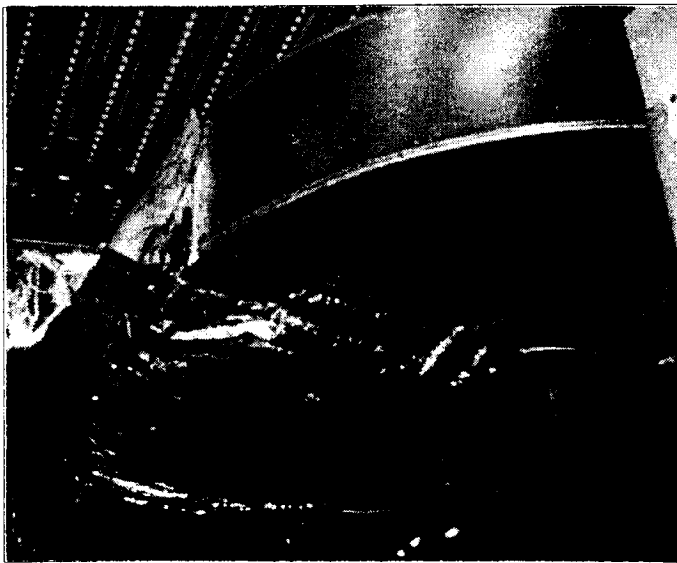


Figure 15

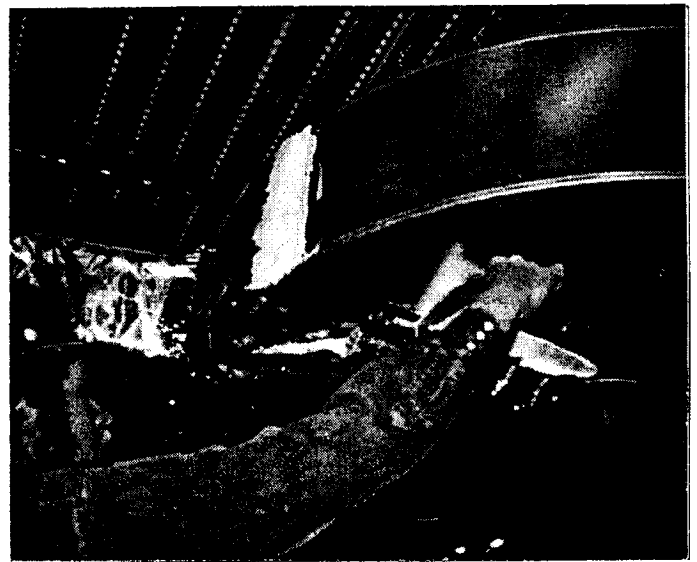


Figure 16



Figure 17

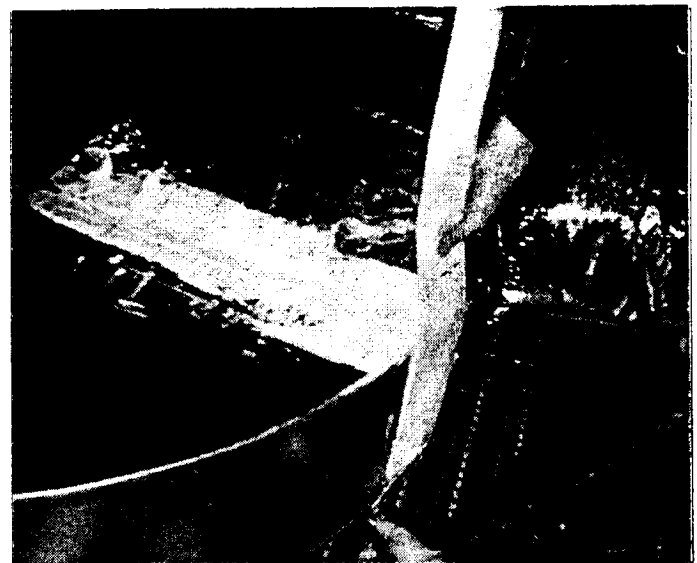


Figure 18

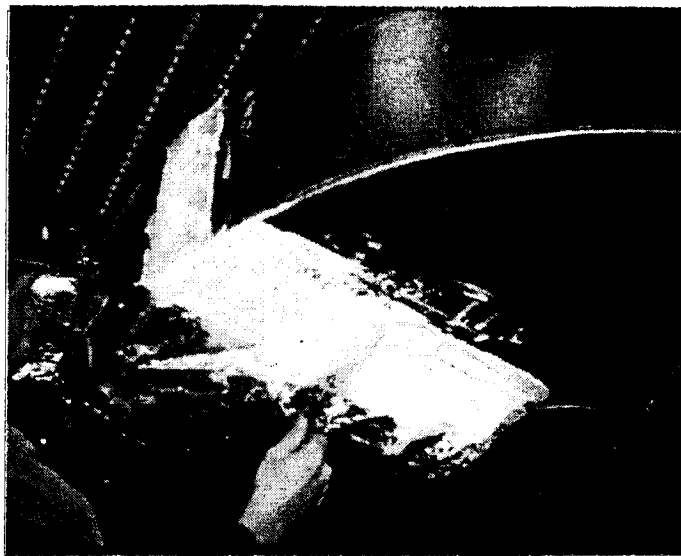


Figure 19



Figure 20

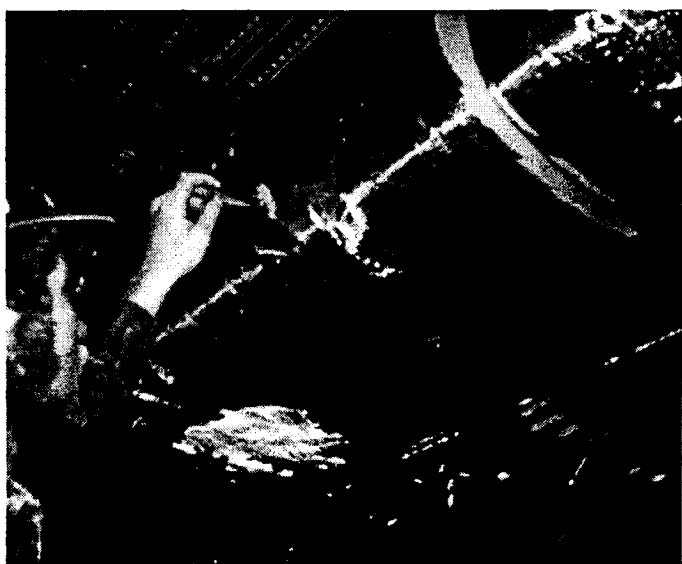


Figure 21

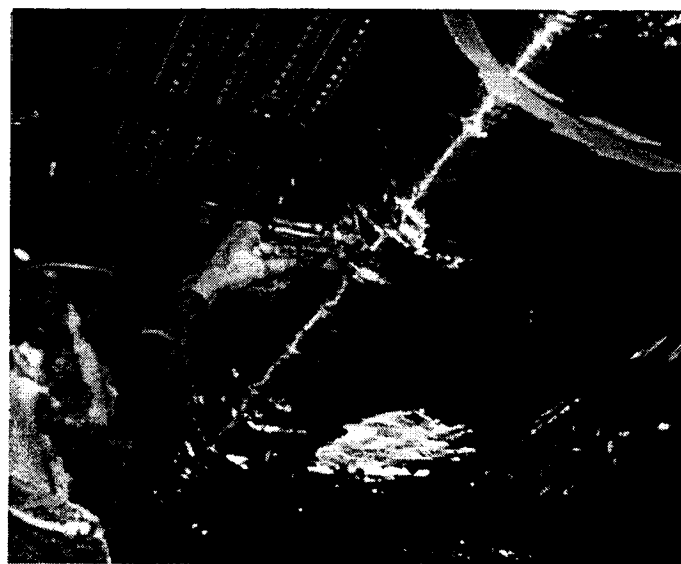


Figure 22

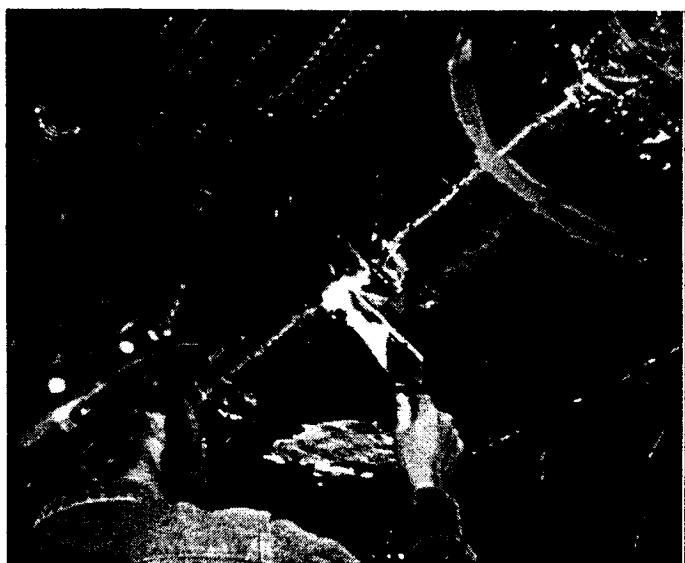


Figure 23